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Published in:
University of Oulu. Department of Information Processing Science. Series A, Research Papers

Publication date:
2008

Document Version
Publisher's PDF, also known as Version of record

Conceptual Analysis of Kairos for Location-based Mobile Services

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Abstract. In order to intervene at the opportune moment, we need to create relevant context-sensing algorithms and inferences for just-in time persuasive messaging. In order to do so, we must first have a thorough understanding of what just-in-time messaging is, and hence kairos. In this paper we will argue that we need to conceptually analyse kairos in a spatio-temporal framework and that we need to reflect on the qualitative aspects of time and place, taking the user's lifestyle, projects and choices in to consideration together with experiences of place.

Keywords: Location-based mobile services, kairos, branching time, lifestyle, projects, sense of place, spatio-temporal framework

1 Introduction

The ubiquity of the mobile phone together with the new context sensitive technologies such as GPS results in the opportunity of creating location-based mobile services (LBMS). These services have to be provided at the most opportune moment in relation to both the most opportune time and the most suitable place. The idea of intervening at the right time (and place) is known as Kairos, a term introduced by Greek rhetoricians between the 5th and 4th BCE. Through history it has most commonly been used to express "the opportune moment" [1:41], but in its classical understanding it has both a spatial and a temporal aspect. When translated from Greek into English it has three meanings. The first one takes into account the ethical and aesthetical dimension; 'due measure', 'proportion' or 'fitness'. The second one is spatial, i.e. related to place, meaning "a vital part of the body", and the third one is temporal; related to time described as "the right point of time", "the proper time or season of action" or "the exact or critical time". These three understandings make kairos all the more interesting for LBMS.

In relation to time and place sensing technologies, the importance of intervening at the right moment is further accentuated and it is even more evident that in order to do so, we need to create good and relevant inference algorithms. We believe that this is only possible to do if we have a more profound theoretical grounding [2]. The intention of this paper is therefore not to present practical guidelines but solely to contribute to a theoretical framework. This is however a necessary addition to the preliminary suggestions made so far on how to utilize kairos.

2 Time

Technologies change our conception of time, how we talk about time, and according to Kristóf Nyíri they also change the nature of time [3:301]. In order to create a conceptual framework for kairos with time as one of the parameters, we therefore need to know how location-based mobile services affect our conception of time.

According to Kristóf Nyíri mobile coordination has resulted in the occurrence of personalized time, because the mobile phone has made it easier for the individual to reschedule appointments to fit her exact situation [4:103]. Nyíri thus acknowledges that the user's situation can change during the day and that time is seen from a specific person's perspective, hence that time is *personalised* [4:103]. This perspective allows for an amalgamation of social and subjective time with astronomical time, the latter being measurable and scientific time [4:110]. This immediately brings to mind a fundamental distinction in the philosophy of time, originally introduced by McTaggart [5]. This is the distinction between A-time, which is time as subjectively experienced depending on the past, present, and future, and B-time, meaning time as numbers, which corresponds to Nyíri's understanding of astronomical time. LBMS makes it possible for the individual to get information anytime, anywhere. It is however not sufficient to know the user's exact location and time in order to provide meaningful information for her. Knowing the user's personalised time is crucial, since this influences what choices she makes in the specific situation. We believe that temporal logic and to be more specific the notion of branching time has a lot to offer when we need to understand choice in relation to both A- and B-time. A.N. Prior (1914-1969) is the founder of branching time and he further developed McTaggarts terms A-time and B-time [6]. The idea of branching time is illustrated in the picture below.

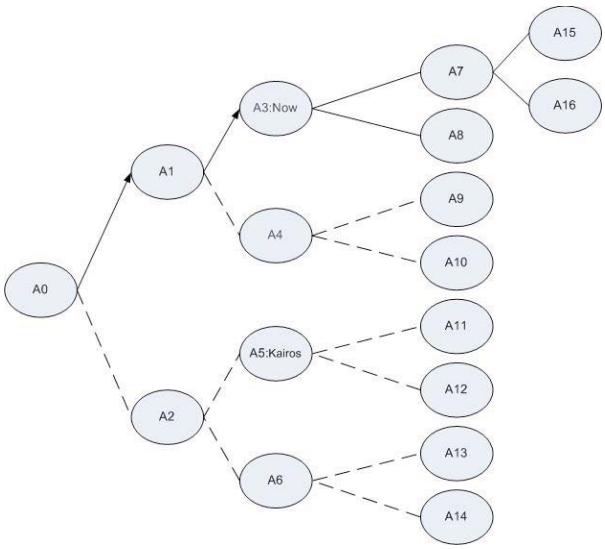

Fig. 1: Picture of branching time

The basic idea is simple. From a given 'now' say A0, there are various possibilities for the next moment. They in turn give rise to new possibilities in the same

manner, but of course some things happen and some don't. In the diagram the arrows between A0, A1, and A3 are meant to point this sequence out as the 'real course of event'.

Each node in the picture illustrates the situations where we make 'the small choices' in our everyday lives e.g. taking the stairs instead of the lift or buying one product and not the other. The 'small choice' is relevant for the individual, because it is made in relation to a certain lifestyle; 'the big choice'. A stable feeling of self-identity is then achieved when the individual is able to keep a certain narrative going and create a biographic continuity across time and place, and to a certain degree be able to communicate it to others [10:102]. The choice then becomes important in order to anchor a certain narrative about the self [10:106]. What is important to stress here is that not only should the alternative choices be real, they must also be meaningful in relation to a specific lifestyle. In relation to that we believe that the individual lifestyle and projects need to be related to time and place: *the spatio-temporal*. When we combine astronomic time and the user's personalised time, which is structured around his or her projects and lifestyle, it is possible to make profiles of e.g. leisure time and work time, which is customized to the individual in every situation. Thus LBMS should contain persuasive forms which the user can fill in, in relation to lifestyle: job, interests etc. as well as she should be able to change her mode on the go e.g. from busy to available. Then in order to relate kairos to an individual event-structure it is important that time-sensing algorithms are able to sense not only astronomic time, but are able to incorporate personalised time as well.

3 Place

As with time, we also need to see place in a more personalised manner. This means that place must be understood not only quantitatively focussing on coordinates, but also as a qualitative term, holding the meaning of mental place. In relation to mobile communication Joshua Meyrowitz uses the term 'sense of place' to emphasise that our experiences are anchored in the physical location (the local). We smell, hear, touch, see and taste through our bodies, our bodies are always in one place, place is always with us [11:21]. In other words we sense in place. In our understanding 'sense of place' is not only bodily but also mental. We believe that mental 'sense of place' can be related to Kenneth J. Gergens term 'presence in place' and Joshua Meyrowitz' 'perspective on place' [11] [12].

According to Meyrowitz we can talk about being present in two places, but only if a distinction between mental and physical presence is made [11:22]. Gergen emphasises that all technologies that allow people to communicate at a distance are powerful contributors to 'absent presence', which means that it is possible to be physically present and mentally absent at the same time. Because LBMS augment our immediate surroundings we believe that they bring another kind of presence into the picture, namely a presence of which one is made aware by the physical surroundings. We here suggest the term 'aware presence'. In order to decide a specific user's 'presence of place', we need a continuum of presence, with 'absent' and 'aware' as the two extremities.

The conceptual analysis of place then adds to the mere notion of physical location, two equal important parameters namely 'perspective on place' and 'presence in

place'. These three factors affect each other mutually. In order to understand both the qualitative as well as the quantitative aspects of place we need to take all dimensions of place into consideration taking both the physical place expressed in coordinates and mental place understood as 'perspective on place' and 'presence in place' into consideration. This understanding of place entails that we do not only need to approach the user at the right physical location; we also need to approach her when she has a 'sense of place', that can be characterized as opportune or right. For example if she has characterized the one hour she spends in the bus everyday as boring and a waste of time, this could be an opportunity to entertain her by practicing a new behavioral pattern. On the other hand if she characterizes this time as preparing time or relaxation time, a suggestion or an intervention may not be opportune.

4 Recap

Since any specific 'now' is not necessarily kairos, it is possible for us to miss kairos if we do not anticipate it and in so far as possible plan how to approach it. In order to plan how to intervene at the right or opportune moment we therefore need to discover kairos in advance. This means that we need to carefully select the right moment to intervene and not just feed the user with information anytime, anywhere, although the technology makes this possible.

In LBMS, time and place are integrated so that kairos is crucially dependent on both. Strikingly, this corresponds to the classical understanding of kairos, which has both a place and a time dimension. Time-sensing algorithms and just-in-time persuasive messaging must in Persuasive Design be based on such a notion of kairos. This means that in order to be able to persuade at the opportune moment we also need to see time as personalised and place as something sensed. If we combine our understanding of place, geographical as well as sensed, with our understanding of time, personalised (A-time) as well as astronomic (B-time) we believe it will put us in the best possible position for defining the right moment beforehand and plan how to approach it. We have illustrated this in the following model.

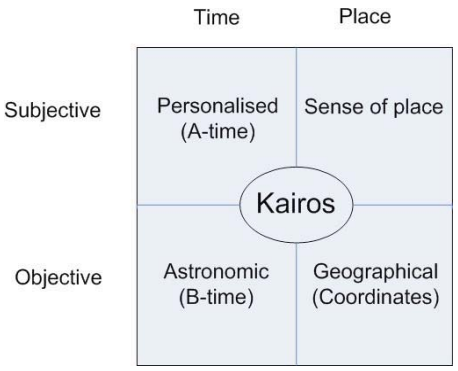

Fig.2: The spatio-temporal aspects of kairos (we are indebted to Per Hasle for the illustration of our idea).

In the article, we have argued that the following elements and aspects are important:

- The role of the user's 'small choices' in relation to her 'big choice'
- The influence of lifestyle and projects on choices
- Branching time: A-time and B-time's close connection to lifestyle and projects
- The qualitative dimension of place; 'perspective on place' and 'presence in place'

All in all, the kairos needed in Persuasive Design for LBMS is a spatio-temporal concept integrating all of the above factors, and taking into consideration all dimensions of time and place. To be sure, the design of algorithms for suggestion or just-in-time intervention will be extremely demanding, but it is in fact at the heart the very idea of mobile persuasion.

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ISBN 978-951-42-8817-3
ISSN 0786-8413